

## CHAPTER 8 NOISE

This section describes the existing noise environment in and around the DeWitt Center Study Area and how it may be affected by the construction, demolition, and operation of the proposed project. Receptors that may be affected by noise are identified, as well as the criteria used to evaluate the compatibility of noise at those receptors. The following discussion describes the fundamentals of acoustics, the results of a site reconnaissance, sound level measurements, acoustical calculations, and assessment of potential noise impacts from construction and facility operations. Where appropriate, mitigation measures are proposed to reduce potential project-related noise impacts to acceptable levels.

### 8.1 SETTING

#### Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels over an extended period has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations, which travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by a number of variables including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above approximately 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is approximately 3 dB. An increase (or decrease) in sound level of approximately 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, this relation holds true for loud sounds and for quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$\begin{aligned}60 \text{ dB} + 60 \text{ dB} &= 63 \text{ dB, and} \\80 \text{ dB} + 80 \text{ dB} &= 83 \text{ dB}\end{aligned}$$

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone that makes the drum vibrate 100 times per second generates a sound pressure wave that is oscillating at 100 Hz; this pressure oscillation is

perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork (a pure tone) contains a single frequency. In contrast, most sounds one hears in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system that reflects the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called “A” weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve. Noise levels at a given location are typically measured over two one-hour periods, once during the day and once during the evening or night.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from several sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level ( $L_{eq}$ ) is used.  $L_{eq}$  is the mean A-weighted sound level during a measured time interval. It is the “equivalent” constant sound level that would have to be produced by a given source to equal the fluctuating level measured. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the  $L_{max}$  and  $L_{min}$  indicators. They represent the RMS (or root-mean-square) maximum and minimum obtainable noise levels during the monitoring interval. The  $L_{min}$  value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$  are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the  $L_{10}$  typically describe transient or short-term events, while levels associated with the  $L_{90}$  describe the steady-state (or most prevalent) noise conditions.

Another sound measure known as the Day-Night Average Noise Level ( $L_{dn}$ ) is defined as the A-weighted average sound level for a 24-hour day. It is calculated by adding a 10 dBA penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. The  $L_{dn}$  is used by agencies such as the U.S. Department of Housing and Urban Development (HUD), the State of California, the City of Auburn, and Placer County to define acceptable land use compatibility with respect to noise. Sound levels of typical noise sources and environments are provided in *Table 8.1* to provide a frame of reference.

**Table 8.1**  
**Sound Levels of Typical Noise Sources and Noise Environments**  
**(A-Weighted Sound Levels)**

<b>Example Noise Source (at a Given Distance)</b>	<b>Scale of A-Weighted Sound Level in Decibels</b>	<b>Example Noise Environment</b>	<b>Human Judgment of Noise Loudness (Relative to a Reference Loudness of 70 Decibels*)</b>
Military Jet Take-off with After-burner (50 ft)	140	Carrier Flight Deck	
Civil Defense Siren (100 ft)	130		
Commercial Jet Take-off (200 ft)	120		<u>Threshold of Pain</u>
			*32 times as loud
Pile Driver (50 ft)	110	Rock Music Concert	*16 times as loud
Ambulance Siren (100 ft)	100		<u>Very Loud</u>
Newspaper Press (5 ft)			*8 times as loud
Power Lawn Mower (3 ft)			
Motorcycle (25 ft)	90	Boiler Room	*4 times as loud
Propeller Plane Flyover (1,000 ft)		Printing Press Plant	
Diesel Truck, 40 mph (50 ft)			
Garbage Disposal (3 ft)	80	High Urban Ambient Sound	*2 times as loud
Passenger Car, 65 mph (25 ft)			<u>Moderately Loud</u>
Living Room Stereo (15 ft)			*70 decibels
Vacuum Cleaner (3 ft)	70		(Reference Loudness)
Electronic Typewriter (10 ft)			
Normal Conversation (5 ft)	60	Data Processing Center	*1/2 as loud
Air Conditioning Unit (100 ft)		Department Store	
Light Traffic (100 ft)	50	Private Business Office	*1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban Ambient Sound	<u>Quiet</u>
			*1/8 as loud
Soft Whisper (5 ft)	30	Quiet Bedroom	
	20	Recording Studio	<u>Just Audible</u>
	10		<u>Threshold of Hearing</u>

Source: Compiled by URS Corporation

### Noise Environment

Some land uses are considered sensitive to noise. Noise-sensitive receptors are land uses associated with indoor and outdoor activities that may be subject to stress or significant interference from noise. They often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. In addition, office land uses can be sensitive to noise when levels are high enough to interfere with working conditions.

### Onsite Receptors

Several onsite noise-sensitive receptors have been identified that may be impacted by construction and/or demolition included in the proposed project. Day-use facilities onsite

include youth and recreation centers, senior center, churches, medical clinics, and schools. Day- and night-use onsite facilities include apartments, three residential shelters (including the alcoholism treatment center), and the residential areas within the detention facilities (Juvenile Hall, Main Jail, minimum security). These receptors are depicted on *Figure 8-1*, and include the following:

- Alder Grove School (Building 216A) in the eastern portion of DeWitt Center,
- Bell Garden Apartments (Buildings 9 and 10) in the northern portion of DeWitt Center (Buildings 2 and 3 will be vacated prior to occurrence of any project-generated noises, Buildings 4 and 5 are currently vacant),
- Charis Youth Center (Building 318) in the southeastern portion of DeWitt Center,
- Children's Receiving Home (Building 217) in the eastern portion of DeWitt Center,
- Components of the detention facilities: Main Jail (Building 520), minimum security (Buildings 302A, 303), and Juvenile Hall (Building 530),
- Foothill Community Church (Building 118) in the eastern portion of DeWitt Center,
- Health and Human Services department medical clinics (Buildings 108A, 117B, and 209) in the eastern portion of DeWitt Center,
- Health and Human Services department school (Building 310) in the southeastern portion of DeWitt Center,
- Lighthouse Baptist Church (Building 320A) in the southeastern portion of DeWitt Center,
- New Faith Community Church (Building 310A) in the eastern portion of DeWitt Center,
- O'Brien Child Development Center (Building 311B) in the eastern portion of DeWitt Center,
- A shelter (Building 203A) in the center of DeWitt Center,
- Sierra Council on Alcoholism Treatment Center (Building 202B) in the center of DeWitt Center,
- Sierra Vista School (Building 203B) in the center of DeWitt Center, and
- Multi-Purpose Senior Center (Buildings 312B, 313, 314) in the eastern portion of DeWitt Center.

### **Offsite Receptors**

Several offsite noise-sensitive receptors have also been identified. These receptors are depicted on *Figure 8-1*, and include the following:

- Senior housing approximately 400 feet north and 900 feet northeast of the LDB site,
- Medical offices located approximately 200 feet north, 300 feet northeast, and 1,000 feet east of the LDB site,
- Rock Creek School located approximately 1,600 feet northeast of the LDB site (with intervening buildings),

■ Figure 8-1

- Auburn Elementary School located approximately 1,650 feet south of the AJC site (with intervening buildings),
- Convalescent housing located approximately 300 feet northwest of the LDB site,
- Sonrise Church located approximately 650 feet west of the LDB site,
- Residential neighborhoods on Bell Road north of DeWitt Center (at least 510 feet north of the LDB site),
- Residential neighborhoods on Atwood Road south of DeWitt Center (at least 600 feet south of the AJC site),
- Residential neighborhood on Wilson Drive west of DeWitt Center (at least 300 feet west of the LDB site).

### Sound Level Measurements

To quantify the existing noise environment near the proposed project area, a series of sound level measurements was taken on April 17 and 18, 2003, at DeWitt Center and the closest residences. Data were gathered using a Larson Davis Model 820 ANSI (American National Standards Institute) Type 1 Integrating Sound Level Meter. The meter was calibrated before and after each measurement period. The meter was mounted on a tripod five feet above the ground. Each measurement location was monitored for one hour during the daytime and nighttime periods. The  $L_{dn}$  was then calculated for each site using the hourly  $L_{eq}$  values.

Six one-hour sound level measurements were taken at onsite and offsite sensitive receptors to quantify the ambient noise environment. The results of the measurements and simultaneous traffic counts are summarized in *Table 8.2* and correspond to the measurement locations depicted in *Figure 8-1*. Details for each measurement location are described below.

- |     |   |
|-----|---|
| ML1 | Measurements were taken at the corner of the north and east property lines of 10810 Atwood Road on April 17 between 2:30 and 3:30 p.m. (daytime hour) and on April 18 between 11:02 p.m. and 12:02 a.m. (nighttime hour). The location is a single-family residence with an adjoining childcare center (Bell's Child Care Center). The measurement was taken 50 feet from the centerline of Atwood Road. The residence is bound by open space on the north and east and residences to the south and west. Simultaneous counts of vehicles on Atwood Road were taken during both measurement periods. Daytime noise sources consisted of vehicular traffic on Atwood Road, aircraft overflights, children playing at the day care center, and birds vocalizing. Nighttime noise sources consisted of vehicular traffic on Atwood Road, aircraft overflights, distant train, dogs barking, and frogs and crickets vocalizing. The daytime $L_{eq}$ was 61.0 dBA, the nighttime $L_{eq}$ was 54.9 dBA, and the calculated $L_{dn}$ was 63 dBA. |
| ML2 | Measurements were taken at the corner of the north and west property lines of 11480 Atwood Road on April 17 between 3:33 and 4:33 p.m. (daytime hour) and 10:00 and 11:00 p.m. (nighttime hour). The location is a single-family residence bound by residential neighborhoods to the south, east, and west,   |

**Table 8.2**  
**Sound Level Measurements (dBA)**

Measurement Identification	Location	Time	Sound Level Measurements						Traffic Counts		
			L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>90</sub>	Autos	Medium Trucks	Heavy Trucks
ML1	10810 Atwood Road	2:30 – 3:30 p.m.	61.0	78.4	32.6	66.4	48.4	37.8	223	1	0
		11:02 p.m. – 12:02 a.m.	54.9	76.4	37.9	54.1	44.3	38.3	18	0	0
ML2	11480 Atwood Road	3:33 – 4:33 p.m.	65.3	83.2	44.0	69.3	60.6	51.4	375	0	0
		10:00 – 11:00 p.m.	55.6	78.0	33.1	54.9	43.9	40.5	26	0	0
ML3	3342 Bell Road	4:35 – 5:35 p.m.	64.8	79.9	39.9	69.4	60.3	47.5	403	3	0
		3:11 – 4:11 a.m.	47.2	71.5	37.7	43.9	39.8	38.6	3	0	0
ML4	Rear Yard of Residence on Wilson Drive facing Richardson Drive	8:00 – 9:00 a.m.	61.0	78.7	40.4	64.9	55.6	47.3	101	1	3
		2:10 – 3:10 a.m.	42.4	58.7	36.8	43.8	39.9	38.3	3	0	0
ML5	Alcoholism treatment center facing C Avenue	9:05 – 10:05 a.m.	54.0	73.5	40.4	54.6	45.5	43.0	15	0	0
		12:00 – 1:00 a.m.	49.3	67.6	37.2	50.0	44.5	42.3	4	0	0
ML6	Foothill Community Church facing First Street	10:10 – 11:10 a.m.	59.8	47.8	40.1	63.4	54.3	46.1	69	4	2
		1:05 – 2:05 a.m.	47.2	65.0	39.5	48.1	44.4	42.0	4	0	0

Measurements taken on April 17 and 18, 2003

and the existing DeWitt Center to the north (across Atwood Road). The measurement was taken 50 feet from the centerline of Atwood Road. Simultaneous counts of vehicles on Atwood Road were conducted during both measurement periods. Daytime noise sources consisted of vehicular traffic on Atwood Road and F Street, noise from the existing operations of DeWitt Center, aircraft overflights, and birds vocalizing. Nighttime noise sources consisted of vehicular traffic on Atwood Road, dogs barking, and frogs and crickets vocalizing. The daytime  $L_{eq}$  was 65.3 dBA, the nighttime  $L_{eq}$  was 55.6 dBA, and the calculated  $L_{dn}$  was 65 dBA.

ML3 Measurements were taken at the corner of the south and west property lines of 3342 Bell Road on April 17 between 4:35 and 5:35 p.m. (daytime hour) and on April 18 between 3:11 and 4:11 a.m. (nighttime hour). The location is a single-family residence bound by medical offices to the east and west, apartments to the north, and the existing DeWitt Center to the south (across Bell Road). The measurement was taken 50 feet from the centerline of Bell Road. Simultaneous counts of vehicles on Bell Road were conducted during both measurement periods. Daytime noise sources consisted of vehicular traffic on Bell Road and Richardson Drive, noise from the existing operations of DeWitt Center, aircraft overflights, and birds vocalizing. Nighttime noise sources consisted of vehicular traffic on Bell Road and frogs and crickets vocalizing. The daytime  $L_{eq}$  was 64.8 dBA, the nighttime  $L_{eq}$  was 47.2 dBA, and the calculated  $L_{dn}$  was 63 dBA.

ML4 Measurements were taken near the east property line (rear yard) of a residence on Wilson Drive on April 18 between 8:00 and 9:00 a.m. (daytime hour) and 2:10 and 3:10 a.m. (nighttime hour). The location is a single-family residence bound by residences to the north, south, and west and the existing DeWitt Center to the east. The measurement was taken 150 feet from the centerline of Richardson Drive. Simultaneous counts of vehicles on Richardson Drive were conducted during both measurement periods. Daytime noise sources consisted of vehicular traffic on Richardson Drive and Bell Road, noise from the existing operations of DeWitt Center, aircraft overflights, people talking as they walked on the sidewalks, distant leaf blower, and birds vocalizing. Nighttime noise sources consisted of vehicular traffic on Richardson Drive and Bell Road, distant traffic on Highway 49, and frogs and crickets vocalizing. The daytime  $L_{eq}$  was 61.0 dBA, the nighttime  $L_{eq}$  was 42.4 dBA, and the calculated  $L_{dn}$  was 59 dBA.

ML5 Measurements were taken at the front entrance of a shelter on the DeWitt Center property on April 18 between 9:05 and 10:05 a.m. (daytime hour) and 12:00 and 1:00 a.m. (nighttime hour). The location is a barracks-style building bound by various DeWitt Center offices on all sides. Simultaneous counts of vehicles on C Avenue were conducted during both measurement periods. Daytime noise sources consisted of vehicular traffic on C Avenue and Richardson Drive, noise from the existing operations of DeWitt Center, aircraft overflights, people talking, and birds vocalizing. Nighttime noise sources



consisted of vehicular traffic on C Avenue and Richardson Drive, distant dogs barking, and frogs and crickets vocalizing. The daytime  $L_{eq}$  was 54.0 dBA, the nighttime  $L_{eq}$  was 49.3 dBA, and the calculated  $L_{dn}$  was 57 dBA.

ML6 Measurements were taken at the front entrance of the Foothill Community Church (Building 118) on the east side of DeWitt Center on April 18 between 10:10 and 11:10 a.m. (daytime hour) and 1:05 and 2:05 a.m. (nighttime hour). The location is a church building bound by various DeWitt Center offices on the south and west and parking lots to the north and east. Simultaneous counts of vehicles on First Street were conducted during both measurement periods. Daytime noise sources consisted of vehicular traffic on First Street, distant traffic on Bell Road and Highway 49, noise from the existing operations of DeWitt Center, aircraft overflights, people talking, and birds vocalizing. Nighttime noise sources consisted of vehicular traffic on First Street, distant traffic on Highway 49, and crickets vocalizing. The daytime  $L_{eq}$  was 59.8 dBA, the nighttime  $L_{eq}$  was 47.2 dBA, and the calculated  $L_{dn}$  was 59 dBA.

## 8.2 REGULATORY FRAMEWORK

### Auburn/Bowman Community Plan

The *Auburn/Bowman Community Plan* contains policies governing noise related to development within the communities of Auburn and Bowman. The *Auburn/Bowman Community Plan* does not specifically address noise generated during construction activities.

- Goal III.F.2.a.** To protect community plan area residents from the harmful and annoying effects of exposure to excessive noise.
- Goal III.F.2.b.** To preserve the rural noise environment of the community plan area and surrounding areas.
- Goal III.F.2.c.** To protect the economic base of the community plan area by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.
- Goal III.F.2.d.** To encourage the application of state of the art land use planning methodologies in areas of potential noise conflicts.
- III.F.3.a New development of noise-sensitive uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 14 as measured immediately within the property line of new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table 14.
- III.F.3.b Noise created by new non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 14 as measured immediately within the property line of lands designated for noise-sensitive uses.
- III.F.3.d The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 16.

**Table 8.3****Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Sources (Table 14 of the Auburn/Bowman Community Plan)**

<b>Noise Level Descriptor</b>	<b>Daytime (7 a.m. to 10 p.m.)</b>	<b>Nighttime (10 p.m. to 7 a.m.)</b>
Hourly $L_{eq}$ , dB	50	45
Maximum Level, dB	70	65

Note: Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily or speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwelling).

Source: Auburn/Bowman Community Plan: Community Development Element

- III.F.3.e New development of noise-sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table 16, unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to the level specified in Table 16.
- III.F.3.f Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels as specified in Table 16 at outdoor activity areas or interior spaces of existing noise-sensitive land uses in either the incorporated or unincorporated areas.
- III.F.3.h Where noise mitigation measures are required to achieve the standards of Tables 14 and 16, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

**Table 8.4****Maximum Allowable Noise Exposure for Transportation****Noise Sources (Table 16 of the Auburn/Bowman Community Plan)**

<b>Land Use</b>	<b>Outdoor Activity Areas<sup>1</sup> (<math>L_{dn}</math>/CNEL, dB)</b>
Residential	60 <sup>2</sup>
Transient Lodging	60 <sup>2</sup>
Theaters, Auditoriums, Music Halls	60 <sup>2</sup>
Churches, Meeting Halls	--
Office Buildings	60 <sup>2</sup>
Schools, Libraries, Museums	--
Playgrounds, Neighborhood Parks	70

- Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
- Where it is not possible to reduce noise in outdoor activity areas to 60 dB  $L_{dn}$ /CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65  $L_{dn}$ /CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table. For properties affected by transportation noise from I-80 or railroad tracks, this maximum level shall be 70  $L_{dn}$ /CNEL, provided that interior levels are in compliance with this table.

Source: Auburn/Bowman Community Plan: Community Development Element

## Placer County General Plan

The *Placer County General Plan* contains policies governing noise related to development within Placer County (1994). The maximum allowable noise exposure limits for transportation noise sources are summarized in *Table 8.5*, which is Table 9-1 of the *Placer County General Plan*. The Noise Element of the *Placer County General Plan* does not specifically address construction noise level limits. Furthermore, the Placer County Code does not contain an explicit Noise Ordinance. However, the Placer County Board of Supervisors has issued a Minute Order that controls construction noise by limiting the hours of operation to the daytime hours of 6 a.m. to 8 p.m. Monday through Friday and 8 a.m. to 6 p.m. Saturday. This order also requires proper maintenance of equipment mufflers and the indication of the equipment staging area on improvement plans. General Plan policies applicable to the proposed project are listed below.

**Table 8.5**

*Allowable  $L_{dn}$  Noise Levels within Specified Zone Districts*

*Applicable to New Projects Affected by or Including Non-Transportation Sources*

<b>Zone District of Receptor</b>	<b>Property Line of Receiving Use</b>	<b>Interior Spaces</b>
Residential adjacent to Industrial	60	45
Other Residential	50	45
Office/Professional	70	45
Neighborhood Commercial	70	45

Source: Table 9-1 from the Noise Element of the Placer County General Plan.

- Goal 9.A** To protect County residents from the harmful and annoying effects of exposure to excessive noise.
- 9.A.1 The County shall not allow development of new noise-sensitive uses where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 9-1 as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table 9-1.
- 9.A.2 The County shall require that noise created by new non-transportation noise sources be mitigated so as not to exceed the noise level standards of Table 9-1 as measured immediately within the property line of lands designated for noise-sensitive uses.
- 9.A.4 Impulsive noise produced by blasting should not be subject to the criteria listed in Table 9-1. Single event impulsive noise levels produced by gunshots or blasting shall not exceed a peak linear overpressure of 122 db, or a C-weighted Sound Exposure Level (SEL) of 98 dBC. The cumulative noise level from impulsive sounds such as gunshots and blasting shall not exceed 60 dB  $L_{Cdn}$  or  $CNEL_C$  on any given day. These standards shall be applied at the property line of a receiving land use.
- 9.A.6 The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Figure 9-1.

- 9.A.7 The County shall purchase only new equipment and vehicles which comply with noise level performance standards based upon the best available noise reduction technology.
- 9.A.8 New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources, including airports, which exceed the levels as specified in Table 9-3, unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to the levels specified in Table 9-3.
- 9.A.9 Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 9-3 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.
- 9.A.12 Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

### **Placer County Airport Land Use Compatibility Plan**

DeWitt Center is located within the jurisdiction of the Placer County Airport Land Use Compatibility Plan, which addresses land uses surrounding airports within Placer County (2000). The Auburn Municipal Airport is located approximately 1.25 miles from DeWitt Center. The Auburn Compatibility Map designates the northeastern corner of DeWitt Center as Zone C2, and rest of DeWitt Center as Zone D. Zone C2 areas are those that experience regular overflights by aircraft approaching and departing the airport, but the overflights are not as frequent or are at higher altitude than in zones closer to the airport. Zone D areas experience less frequent overflights and at higher altitudes than overflights in Zone C2. DeWitt Center is located outside the 55 dB Community Noise Level contour (CNEL is approximately 1 dBA greater than  $L_{dn}$ ), but is located within the "Airport Influence Area" as designated in the Airport Land Use Compatibility Plan.

## **8.3 IMPACTS**

This section identifies and discusses the potential environmental impacts resulting from the proposed project, and suggests mitigation measures to reduce the levels of impact. A detailed discussion of mitigation measures is included in Section 8.4, Mitigation Measures.

### **Significance Criteria**

Potential significant impacts associated with noise have been evaluated using the following criteria, as identified in Appendix G of the CEQA Guidelines:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies,
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels,

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project,
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project,
- For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project to excessive noise levels, or
- For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

### ***Impacts Determined to be Less than Significant***

***Substantial Permanent Increase in Ambient Noise Levels.*** Noise sources as a result of implementation of the proposed facility plan would remain the same as those identified for the existing conditions, that is vehicular traffic on adjacent roadways. The California Department of Transportation (Caltrans) Sound32 Traffic Noise Prediction Model (based on FHWA RD-77-108) with California Reference Energy Mean Emissions Levels was used to calculate existing, future, and future with project traffic noise levels 50 feet from the centerline of each roadway and at identified noise sensitive receptors. The modeling effort considered estimated average vehicle speed, peak hour traffic (DKS Associates 2003), and traffic mix. For Bell Road, the posted speed limit of 35 miles per hour (mph) and a traffic mix of 98.25 percent autos, 1.5 percent medium trucks, and 0.25 percent heavy trucks were used. For Atwood Road, the posted speed limit of 35 mph and a traffic mix of 96.5 percent autos, 2.25 percent medium trucks, and 1.25 percent heavy trucks were used. For Richardson Drive, the posted speed limit of 25 mph and a traffic mix of 99 percent autos, 0.75 percent medium trucks, and 0.25 percent heavy trucks were used. For First Street, the posted speed limit of 15 mph and a traffic mix of 99.25 percent autos, 0.75 percent medium trucks, and 0 percent heavy trucks were used.

The model assumed “hard” site sound propagation conditions. Strictly speaking, a hard site propagation rule decays sound from a source to a receiver at a rate of 3.0 dB per doubling of distance from the source-receiver pair. This rule applies to the propagation of sound waves with no ground interaction or the interaction with a hard (hence the term) surface such as roadways, asphalt parking lots, or hard-packed graded lots. *Table 8.6* shows the noise levels for existing and future (Year 2020) conditions with and without the proposed project for each roadway at 50 feet and at the sensitive receptors. A review of the table shows that the project-related noise levels along the roadways would increase by less than 2.0 dBA  $L_{dn}$  under both the future (Year 2020) no project and with project conditions. Sound level variations of less than 3.0 dB are not detectable by the typical human ear. Sound levels along the roadways currently exceed the 60 dBA  $L_{dn}$  *Auburn/Bowman Community Plan* significance criteria at several locations. However, since the contribution of vehicular traffic as a result of the project is not detectable, the impact would be less than significant.

**Table 8.6**  
**Roadway Segment Calculated  $L_{dn}$  Sound Levels**

Roadway	Receptor	Distance From Roadway (ft)	Existing Condition		Year 2020 No Project		Year 2020 With Project		Delta <sup>2</sup>
			Peak Hour Traffic <sup>1</sup>	Calculated Level (dBA)	Peak Hour Traffic	Calculated Level (dBA)	Peak Hour Traffic	Calculated Level (dBA)	
Atwood Road	50 feet from centerline	50	740	65	950	66	960	66	1
	ML1	50	740	65	950	66	960	66	1
	ML2	50	740	65	950	66	960	66	1
Bell Road	50 feet from centerline	50	810	65	1,240	67	1,270	67	2
	ML3	50	810	65	1,240	67	1,270	67	2
	ML4	150	810	60	1,240	62	1,270	62	2
Richardson Drive	50 feet from centerline	50	360	57	500	58	510	58	1
	ML5	75	360	54	500	55	510	56	2
First Street	50 feet from centerline	50	460	53	390	52	270	51	-2
	ML6	50	460	53	390	52	270	51	-2

1. Peak hour traffic provided by DKS Associates (2003)

2. Delta is difference between Year 2020 With Project and Existing Condition

**Exposure of People Residing or Working in the Project to Excessive Noise Levels Related to Airport/Airstrip Activities.** DeWitt Center is located approximately 1.25 miles from the Auburn Municipal Airport, outside the 55 dB CNEL contour, but within the “Airport Influence Area” as designated on Exhibit 4E in the Airport Land Use Compatibility Plan (Placer County Airport Land Use Commission 2000). The State of California (California Code of Regulations Title 21) and the FAA (Part 150 Regulation) consider sound levels less than 65 dB CNEL to be compatible with all land uses. Therefore, the project would not expose people residing or working in DeWitt Center to excessive noise levels from Auburn Municipal Airport. There are no private airstrips in the vicinity of DeWitt Center. This impact is considered less than significant.

### **Potentially Significant Impacts**

#### **Impact 8.1 A Substantial Temporary or Periodic Increase in Ambient Noise Levels that Exceed General Plan or Noise Ordinance Standards in the Project Vicinity Above Levels Existing Without the Project**

<b>Significance Before Mitigation:</b>	Potentially Significant
<b>Mitigation:</b>	8.1a
<b>Significance After Mitigation:</b>	Less than Significant

Temporary increases in ambient noise levels are expected to occur during demolition and construction phases of the proposed project. These increases would be significant if they generate noise levels “in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies” (first significance criterion listed above). As discussed in the Regulatory Framework section, the Community Development Element of the *Auburn/Bowman Community Plan* and the Noise Element of the *Placer County General Plan* do not specifically address construction noise level limits. In the absence of County standards defining construction related sound level limits, the U.S. Environmental Protection Agency (EPA) guidelines are used in this EIR to evaluate the significance of a noise impact. The guidelines are based on a body of research. EPA research has shown that whenever intrusive noise exceeds approximately 60 dBA indoors, there will be interference with speech communication (EPA 1974), while other research has found that sound levels above 50 dBA in the interior of buildings may impair room acoustics and affect customary use of the space by disrupting and interfering with speech (Knudsen and Harris 1978). This analysis relies on the 50 dBA threshold as it is the more restrictive standard. (Additional 1974 EPA research conclusions show that a steady A-weighted background level of 60 dBA will produce 98 percent sentence intelligibility; that of 65 dBA will produce 93 percent intelligibility; that of 70 dBA will produce 66 percent intelligibility; and that of 75 dBA will produce 2 percent intelligibility.)

Buildings with windows closed typically provide a noise reduction ranging between 15 dBA and 25 dBA. The high end of this range has been used for this study given the construction type of the existing buildings, which is solid masonry and concrete. Therefore, if the exterior sound level was 75 dBA, the interior sound with the windows closed would be approximately 50 dBA. Thus, sound levels exceeding 75 dBA at the exterior of a building could result in short-term adverse impacts.

**Construction/Demolition Impacts.** As discussed in **CHAPTER 2, PROJECT DESCRIPTION**, construction of the proposed project would proceed in 10 phases (A through J). Noise would

result from the operation of construction and demolition equipment. The increase in noise level would be primarily experienced close to the noise source. The magnitude of the impact would depend on the type of demolition/construction activity, noise levels generated by various pieces of equipment, duration of the activity phase, and distance between the noise source and receiver. *Figure 8-2* shows average noise levels generated by individual pieces of construction equipment. Sound levels of typical construction equipment will range from approximately 65 dBA to 95 dBA at 50 feet from the source (U.S. Environmental Protection Agency [U.S. EPA], 1971). Sound levels of typical demolition equipment will range from approximately 65 dBA to 90 dBA at 50 feet from the source.

Acoustical calculations were performed using the high and low end of the typical equipment sound levels to estimate noise from construction and demolition activities at the closest receptors. Noise from the activity was assumed to have point source acoustical characteristics. Strictly speaking, a point source sound decays at a rate of 6 dB per doubling of distance from the source receiver pair. This is a logarithmic relationship describing the acoustical spreading of a pure, undisturbed spherical wave in air. The rule applies to the propagation of sound waves with no ground interaction. Office buildings in direct line-of-sight within 500 feet of construction and/or demolition may experience sound levels above 75 dBA. The following summarizes the activities, duration, types of equipment used, sensitive receptors in the direct line of sight for each phase, and estimated sound levels at the receptors.

### **Phase A**

This phase is scheduled to occur from March 2003 through April 2004 and includes three major operations.

- 1) The relocation of residents of Bell Gardens Buildings 2 and 3. No noise impacts are associated with this operation.
- 2) The demolition of the WWTP in the west portion of DeWitt Center. Potential impacts to noise-sensitive receptors during demolition include:
  - Juvenile Hall located 600 feet to the east may experience levels of 43 to 68 dBA.
  - Main Jail located 1,100 feet to the east may experience levels of 38 to 63 dBA.
  - Residences located 750 feet to the northwest may experience levels of 41 to 66 dBA.
  - Residences located 950 to the southwest may experience levels of 39 to 64 dBA.
  - Church located 800 feet to the north may experience levels of 43 to 68 dBA.

As none of these noise levels exceed 75 dBA, there are no significant impacts associated with this portion of Phase A.

- 3) The demolition of Buildings 2 through 5 (Bell Gardens Apartments). Potential impacts to noise-sensitive receptors during demolition include:
  - Convalescent housing located 600 feet to the northwest may experience levels of 43 to 68 dBA.



Figure 8-2

- Residences located 300 feet to the west (Buildings 9 and 10) may experience levels of 49 to 74 dBA. The intervening buildings, Buildings 1, 7, and 8, will serve to reduce these noise levels.
- Residences located 510 feet to the north may experience levels of 45 to 70 dBA.
- Medical centers located 500 feet to the north, 600 feet to the northeast, and 900 feet to the northeast may experience levels of 45 to 70 dBA, 43 to 68 dBA, and 40 to 65 dBA, respectively.
- Rock Creek School located 1,800 feet to the northeast may experience levels of 34 to 59 dBA.
- Foothill Community Church located 1,000 feet to the southeast may experience levels of 39 to 64 dBA.
- Day use clinic located 1,000 feet to the southeast may experience levels of 39 to 64 dBA.

As none of these noise levels exceed 75 dBA, there are no significant impacts associated with this portion of Phase A. Thus, there are no significant noise impacts in Phase A.

### **Phase B**

Construction of the Land Development Building (LDB). Phase B is scheduled to occur May 2004 through November 2005. Potential impacts to noise-sensitive receptors during construction include:

- Convalescent housing located 600 feet to the northwest may experience levels of 43 to 73 dBA.
- Residences located 300 feet to the west (Buildings 9 and 10) may experience levels of 49 to 79 dBA. The intervening buildings, Buildings 1, 7, and 8, may serve to reduce these noise levels.
- Residences located 510 feet to the north may experience levels of 45 to 75 dBA.
- Medical centers located 500 feet to the north, 600 feet to the northeast, and 900 feet to the northeast may experience levels of 45 to 75 dBA, 43 to 73 dBA, and 40 to 70 dBA, respectively.
- Rock Creek School located 1,800 feet to the northeast may experience levels of 34 to 64 dBA.
- Foothill Community Church located 1,000 feet to the southeast may experience levels of 39 to 69 dBA.
- Day use clinic located 1,000 feet to the southeast may experience levels of 39 to 69 dBA.

Most of these noise levels do not exceed 75 dBA. The only potentially significant impacts associated with Phase B occur at the residences located in Buildings 9 and 10. These impacts would only result from construction activities in those portions of the LDB site that have a

direct line of sight to the buildings. Therefore, the impacts would be short-term and adverse, but not significant.

### **Phase C**

Construction of the Auburn Justice Center (AJC). Phase C is scheduled to occur from June 2004 through December 2005. Potential impacts to noise sensitive receptors during construction include:

- Residences located 660 feet to the north may experience levels of 43 to 73 dBA
- Residences located 600 feet to the south may experience levels of 43 to 73 dBA
- Existing shelter located 300 feet to the east may experience levels of 49 to 79 dBA. This building is separated from the project site by two other buildings, therefore the actual noise levels at the shelter are anticipated to be lower.
- Existing Sierra Council on Alcoholism treatment center located 240 feet to the east may experience levels of 49 to 79 dBA. This building is separated from the project site by one other building, therefore the actual noise levels at the shelter are anticipated to be lower.
- Minimum Security area located 290 feet to the southeast may experience levels of 50 to 80 dBA. This building is located slightly lower in elevation than the project site, and line-of-sight between this building and the project site is partially blocked. These conditions will serve to lower the actual noise levels at this building.
- Main Jail located 50 feet to the southeast may experience levels of 65 to 95 dBA, however as the housing units of the jail are not located adjacent to the construction site and there are no windows facing the site, this is not considered to be a significant impact requiring noise attenuation.
- Juvenile Hall located 120 feet to the west may experience levels of 57 to 87 dBA, however as the housing units of the juvenile hall are not located adjacent to the construction site and there are no windows facing the site, this is not considered to be a significant impact requiring noise attenuation.

Some of these noise levels exceed 75 dBA, but most will be lowered by blocks in the line-of-sight between the project site and the affected noise-sensitive receptors. The existing shelter and Sierra Council on Alcoholism treatment center will only experience significant noise impacts when construction activities are occurring in the area of the project site closest to Richardson Drive, and therefore closest to the shelter and treatment center. Significant impacts requiring noise attenuation associated with Phase C are not expected to occur.

### **Phase D**

Rough site grading and provision of infrastructure for the Children's Emergency Shelter and Women's Center (CES and WC). Phase D is scheduled to occur from July 2004 through November 2005. Construction of these facilities is not included in the currently proposed project, but is expected to occur as a result of the project. Construction of the CES is anticipated to occur between May 2005 and May 2006, while construction of the WC is expected between August 2004 and November 2005. Additional project-level environmental review will be

conducted for each construction project. In order to provide a programmatic level of assessment of the anticipated future construction, this analysis includes evaluation of the potential impacts of construction. Potential impacts to noise sensitive receptors during Phase D and future construction include:

- Residences located 90 feet to the south may experience levels of 60 to 90 dBA
- Residences located 600 feet to the north may experience levels of 43 to 73 dBA
- Residences located 1,200 feet to the northeast may experience levels of 37 to 67 dBA
- Juvenile Hall located 750 feet to the east may experience levels of 41 to 71 dBA
- Main Jail located 1,100 feet to the east may experience levels of 38 to 68 dBA

Most of these noise levels do not exceed 75 dBA. Significant impacts associated with Phase D are anticipated to occur at the residences located in 90 feet south of the southern portion of the CES site. This will be evaluated during subsequent project-specific environmental review. Mitigation measures for potentially significant impacts will be developed as part of that review.

#### ***Phase E***

Transfer employees currently occupying the 100 block (B Avenue) to the LDB in November and December 2005. Transfer employees from Buildings 15 through 18 to Buildings 102 through 106 from January 2006 through June 2006. No noise impacts are associated with this activity.

#### ***Phase F***

Transfer Sheriff's department and portion of the District Attorney and Probation staff from throughout DeWitt to the new AJC from December 2005 through February 2006. Subsequent to this relocation, the demolition of Buildings 1, 7, 8, and three temporary structures can proceed between February 2006 and April 2006. Demolition of Buildings 15 through 18 can proceed from June 2006 through September of 2006. The noise-sensitive receptors and potential impacts are the same as those identified for Phases A and B. Demolition noise levels at the residences in Buildings 9 and 10 are expected to range between 44 and 75 dBA. The parking area of the LDB site will be expanded between March and August 2007. The noise-sensitive receptors are the same as those identified for Phase B. Significant impacts associated with Phase F are anticipated to occur at the residences in Buildings 9 and 10.

#### ***Phase G***

Phase out the remaining occupancies in Buildings 204B, 205B, 206B, and 207A&B between November 2005 and October 2006. No noise impacts are associated with this activity.

#### ***Phase H***

Demolition of Buildings 204B, 205B, 206B, and 207A&B from October 2006 through January 2007. Demolition would start with Building 207A&B and move to the west. Potential impacts to noise-sensitive receptors during demolition include:

- Residences located 800 feet to the south may experience levels of 41 to 66 dBA
- Residences located 1,200 feet to the northwest may experience levels of 37 to 62 dBA

- New Faith Community Church located 540 feet to the east may experience levels of 44 to 69 dBA
- O'Brien Child Development Center located 600 feet to the east may experience levels of 43 to 68 dBA
- Charis Youth Center located 440 feet to the east may experience levels of 46 to 71 dBA
- Minimum security area located 300 feet to the south may experience levels of 49 to 74 dBA
- Existing shelter approximately 40 feet west of Building 204 could experience levels of 65 to 95 dBA during demolition of the adjacent buildings. However, the residents of this facility would be transferred to the proposed new WC prior to demolition of the adjacent buildings, thus avoiding any significant impacts.
- Existing alcoholism treatment center approximately 150 feet west of Building 204 may experience levels of 47 to 72 dBA during demolition of Building 207A&B (distance of 375 feet) and levels of 49 to 74 dBA during demolition of Building 206B (distance of 300 feet). These impacts would be less than significant. During demolition of Building 205B (distance of 225 feet), the shelter may experience levels 52 to 76 dBA. During demolition of Building 204B, the shelter may experience levels of 56 to 81 dBA. These noise levels would be attenuated by the intervening buildings, thus reducing the noise levels during demolition of Building 205B to less than significant levels. Potentially significant impacts would occur only during demolition of Building 204B.
- Main Jail located 420 feet to the west may experience levels of 47 to 72 dBA

Significant impacts associated with Phase H are expected to occur only during demolition of Building 204B and to affect only the alcoholism treatment center. Noise attenuation would be required at this site as described in *Mitigation Measure 8.1a*.

### **Phase I**

Phase out the remaining occupancies of Buildings 212A&B through 217A&B from January 2005 through December 2007. No noise impacts are associated with this activity.

### **Phase J**

Demolition of Buildings 212A&B through 217A&B from December 2007 through March 2008. Potential impacts to noise-sensitive receptors during demolition include:

- Residences located 1,200 feet to the southeast may experience levels of 37 to 62 dBA
- Senior Center located 100 feet to the south may experience levels of 59 to 84 dBA
- New Faith Community Church located 100 feet to the south may experience levels of 59 to 84 dBA
- Day use clinic located 100 feet to the north may experience levels of 59 to 84 dBA

- Foothill Community Church located 100 feet to the north may experience levels of 59 to 84 dBA
- O'Brien Child Development Center located 100 feet to the south may experience levels of 59 to 84 dBA. This facility is located in the southern wing of its building. The northern wing will act as an intervening building blocking the line-of-sight between the demolition and this facility. Therefore the noise level at this facility is anticipated to be lower than 75 dBA.

Noise levels exceeding 75 dBA could occur at the Senior Center, the New Faith Community Church, the day use clinic, and the Foothill Community Church. These represent significant impacts of Phase J. In addition, demolition of Buildings 212A&B may generate noise levels between 65 and 90 dBA at Building 211. Building 211 houses the Placer County Elections Division and the Placer County Food Bank. While these are not considered noise-sensitive uses, interior noise levels in excess of 65 dBA make communication difficult, as documented by the EPA research in 1974 cited on page 8-15 of this EIR. With the 25 dBA noise attenuation from exterior to interior noise levels, the levels anticipated within Building 211 during demolition of Building 212A&B are between 40 and 65 dBA. This results in a less than significant impact.

To minimize the potential for adverse impacts, the construction contractor would be required to prepare a Site-Specific Construction Noise Control Plan prior to commencement of demolition or construction activities for project phases expected to generate noise levels at sensitive receptors in excess of 75 dBA. This plan will describe measures to reduce construction/demolition noise to the maximum extent practicable, with the goal of limiting average noise levels over a daily construction shift to 75 dBA. Construction will occur only within the established Placer County construction hours – 6 a.m. to 8 p.m., Monday through Friday and 8 a.m. to 6 p.m. Saturday. Although noise from construction at any one project site could be considered a short-term and adverse but less than significant impact, the proposed project includes construction at several sites and in multiple years. Therefore the generation of noise levels exceeding 75 dBA at sensitive receptors identified in this analysis is considered a significant impact of the proposed project. Preparation of a Site-Specific Construction Noise Control Plan for each project phase in which potentially significant impacts are anticipated to occur restricting hours that construction and demolition can take place and requiring provision of noise barriers will reduce this impact to a less than significant level.

## **8.4 MITIGATION MEASURES**

### **A Substantial Temporary or Periodic Increase in Ambient Noise Levels that Exceed General Plan or Noise Ordinance Standards in The Project Vicinity Above Level Existing Without the Project**

**Mitigation Measure 8.1a:** A Site-Specific Construction Noise Control Plan shall be prepared prior to the commencement of each construction or demolition phase expected to exceed 75 dBA at any sensitive receptors. The plan shall evaluate noise levels of the construction or demolition activity at the above receptors based on the time and duration of specific activities and the specific equipment that will be used by the contractor. The attenuating effects of intervening structures should be considered. The plan shall identify construction hours and specific noise control measures that

would reduce the noise level to 75 dBA or lower at affected receptors. The construction contractor shall consider implementation of the following measures in the construction noise control plan:

- Select equipment capable of performing the necessary tasks with the lowest sound level and the lowest acoustic height possible.
- All construction equipment shall be operated and maintained to minimize noise generation. Equipment and vehicles will be kept in good repair and fitted with “manufacturer-recommended” mufflers.
- Noise barriers are typically used to control noise from construction. A barrier must have sufficient mass to attenuate the low frequency component of the construction equipment; therefore, flexible mat-type barriers would not be adequate. The barrier must be high enough to block the line-of-sight between the noise source and the receptor. Depending on the construction methodology, a barrier can be placed in the near field (close to the noise source) or in the far field (close to the receptor). Barriers are only needed when and where noise levels at a noise sensitive receptor are expected to exceed 75 dBA and where noise levels at a non-noise sensitive receptor are expected to exceed 90 dBA. Barriers do **not** need to be constructed masonry walls or wood fences. They need only to block the line of sight between the noise source and the receptor. They could consist of plywood sheets temporarily placed in the field, parked trucks, or other solid material that blocks the line of sight to the receptor. The plan should identify the proper height, location, and effectiveness of a noise barrier.

*This page intentionally left blank.*